I. Claims

What is claimed is:

1. A system for remotely adjusting an antenna's setting with respect to plumb, level (hereinafter referred to as plumb-to-level, or P-L), and azimuth (hereinafter referred to as a compass heading, or CH) comprising:
   the antenna,
   its optimizing apparatus,
   said optimizing apparatus in communication with said antenna,
   a field interconnection box,
   said optimizing apparatus in communication with said field interconnection box,
   a power source,
   said power source in communication with said field interconnection box,
   a computer,
   said computer in communication with said field interconnection box.

2. The system set forth in claim 1 having a plurality of antennas.

3. The system set forth in claim 2 wherein the plurality of antennas form a sector.

4. The system set forth in claim 3 wherein the plurality of sectors form an array.

5. The system set forth in claim 1 having a plurality of field interconnection boxes and interconnecting cables there between.

6. The system set forth in claim 1 having a plurality of power sources wherein the power sources are DC.

7. The system set forth in claim 1 wherein the power source is AC.

8. The system set forth in claim 1 wherein the power source is a generator.

9. The system set forth in claim 1 wherein the power source is green power.

10. The system set forth in claim 3 wherein said antennas having capacity to spare are swept into a new sector with a higher traffic load,

11. The system set forth in claim 1 wherein the computer is a laptop computer.

12. The system set forth in claim 1 wherein the computer is a desktop computer.

13. The system set forth in claim 1 wherein the computer is a mainframe computer.

14. The system set forth in claim 1 wherein said antenna is mounted on a tower.

15. The system set forth in claim 1 wherein said antenna is mounted on a manmade structure.

16. The system set forth in claim 1 wherein said antenna is mounted on a natural structure.

17. The system set forth in claim 5 wherein said interconnection cable is a wire cable.

18. The system set forth in claim 5 wherein said interconnection cable is a fiber optic cable.

19. An apparatus for remotely adjusting an antenna's setting with respect to plumb, level (hereinafter referred to as plumb-to-level, or P-L), and azimuth (hereinafter referred to as compass heading, or CH) comprising:

a first upper tilt bracket having a first end and a second end,

a lower tilt bracket having a first end and a second end,

an antenna having a top end and a bottom end, said top end of said antenna affixed to said first end of said upper tilt bracket, and said bottom end of said antenna affixed thereto the first end of said lower tilt bracket,

a P-L actuator having a first end and a second end, said first end of said P-L actuator is affixed to said second end of said first upper tilt bracket, and said second end of said P-L actuator is affixed to said second end of said lower tilt bracket,

an actuator bracket,

said actuator bracket is in communication with said P-L actuator,

a mounting bar,

said mounting bar in communication with said actuator bracket,

a pair of universal fasteners, said fastener of each bracket having a first end and a second end,

a CH actuator having a first end and a second end,

said first end of the pair of universal fasteners attached to the second end of the CH actuator, and the second end of the pair of the universal fasteners attached to the mounting

bar,

a second upper tilt bracket having a first end and a second end,

the first end of the second upper tilt bracket in communication with the first end of the CH actuator, and the second end of the second upper tilt bracket is in communication with the CH tie bar,

a pair of pitman arms, each pair having a first end and a second end,

the first end of said pitman arm attached to said CH tie bar and said second end attached to said second end of said P-L actuator.

20. The actuator bracket set forth in claim 18 comprising a vertical tube, said vertical tube having an inside surface, and having a P-L actuator inserted into said tube.

21. The device of claim 19 having heavy grease packed between said P-L actuator and the inside of said tube.

22. The apparatus as set forth in claim 18 wherein said first end of said pitman arms are attached to said CH tie bar using attachment pins.

23. The apparatus as set forth in claim 18 having a plurality of antennas.

24. The actuator as set forth in claim 18 having:

a crown, a dust shield, and a main body,

said crown having a top end and a bottom end, and a square socket in said bottom end,

said dust shield having a top end and a bottom end, and having an inside surface,

a set of attaching pins,

said crown seated in and in communication with said inside surface of said top end of said dust shield, and held in place by said set of attaching pins,

a set of three rings,

said dust shield having grooves in said inside surface of said bottom end for receiving said set of rings,

said main body having a top end and a bottom end, and having an inside surface and an outside surface,

a dust seal bearing,

said dust seal bearing in communication with said inside surface of said bottom end of said dust shield, and said outside surface of said main body, and retained there between by said three ring set,

a linear ram,

said linear ram having a bottom end and an inside surface and an outside surface,

said linear ram in communication with said square socket in said bottom of said crown, and held in place by said set of attaching pins,

a set of spines,

said spines having an inside surface and an outside surface,

said spines in communication with said inside surface of said main body,

a motor, a motor mount and an electronics board,

said motor mount having a top end and a bottom end, and an outside surface,

said motor mount having lock teeth on said top end,

said motor in communication with said motor mount,

said spine in communication with said inside surface of said maid body and in communication with said outside surface of said motor mount, and placed there between,

a drive coupler,

said drive coupler in communication with said drive end of said motor,

a drive shaft,

a roll pin,

said drive shaft having a top end and a bottom end, and having an inside surface and an outside surface,

said drive coupler in slip fit communication with said bottom end of said drive shaft and retained therein by said roll pin,

an anti-rotate lock cap,

said anti-rotate lock cap having a top end and a bottom end, and an inside surface,

said bottom end of said anti-rotate lock cap having lock teeth,

said inside surface of said anti-rotate lock cap in communication with said outside surface of said drive shaft,

a drive socket,

said drive socket having a top end and a bottom end, and having an inside surface and an outside surface,

said outside surface of said bottom end of said drive socket in communication with said inside surface of said top end of said drive shaft,

said lock teeth on said anti-rotate lock cap in communication with said lock teeth on said motor mount,

a drive shaft bearing spacer, a drive nut, and a length of all-thread,

said drive shaft bearing spacer having an outside surface,

said outside surface of said drive shaft bearing spacer in communication with said inside

surface of said spines,

said drive nut having a top end and a bottom end,

said length of all-thread having a top end and a bottom end,

said drive nut in communication with said bottom end of said all-thread,

a lock bolt,

said lock bolt having a top end and a bottom end,

said lock bolt in communication with said bottom end of said all-thread,

said top end of said lock bolt in communication with said bottom end of said drive nut,

a bearing block with thrust bearings,

said bearing block with thrust bearings having a top end and a bottom end, and an outside surface,

said bearing block with thrust bearings in communication with said length of all-thread,

said top end of said drive nut in communication with said bottom end of said bearing block with thrust bearings,

a pair of bearing position lock nuts,

said bearing position lock nuts having a top end and a bottom end,

said bottom end of said bearing position lock nuts in communication with said top end of said bearing block with thrust bearings,

a linear ram nut,

said linear ram nut in communication with said length of all-thread,

said linear ram nut in communication with said inside surface of said bottom end of said linear ram,

a pair of ram bearing guides,

said pair of ram bearing guides are in communication with the inside surface of the spines and in communication with the outside surface of the linear ram, and positioned there between,

all-thread end lock nuts,

said all-thread end lock nuts in communication with said top end of said all-thread,

a limit switch rod,

said limit switch rod having a top end and a bottom end,

two pair of limit switch position lock nuts,

said pair of limit switch position lock nuts in communication with said top end of said limit switch rod and in communication with said bottom end of said limit switch rod,

a limit switch trigger block,

a limit switch,

said limit switch trigger block in communication with said limit switch rod,

said limit switch in communication with said limit switch trigger block.

25. A system for remotely adjusting the P-L and CH of an antenna as in claim 3 wherein said upper and said lower field interconnection boxes further comprise:

a P-L actuator and a P-L detector for each antenna,

a CH actuator and a CH detector for each sector,

a P-L actuator activation relay and a CH actuator activation relay,

a P-L detector activation relay and a CH detector activation relay,

said P-L detector activation relay and said P-L actuator activation relay are housed within said P-L actuator,

said CH actuator activation relay is housed within said CH actuator and said CH detector activation relay is housed within said upper field box,

wires,

said wires being connected from said P-L detector to said P-L actuator,

said wires being connected from said P-L actuator to said upper field box,

said wires being connected from said CH detector and said CH actuator being connected to said upper field box,

an electronic P-L circuit board and an electronic compass,

said electronic P-L circuit board in communication with said P-L detector,

a first analog to digital converter,

said first analog to digital converter in communication with said electronic P-L circuit board,

said electronic compass in communication with said CH detector,

a second analog to digital converter,

said second analog to digital converter in communication with said electronic compass,

a first octal bus line driver, a second octal bus line driver, and a third octal bus line driver,

said first octal bus line driver is in communication with said first analog to digital converter,

said second octal bus line driver is in communication with said second analog digital converter,

said third octal bus line driver is in communication with said first and said second octal bus line drivers,

a 4 to 16 line decoder/demultiplexer,

said 4 to 16 line decoder/demultiplexer is in communication with each P-L detector activation relay, each P-L actuator activation relay, each CH detector activation relay, and each CH actuator activation relay,

a first and a second optoisolator module,

said first optoisolator is in communication with said 4 to 16 line decoder/demultiplexer,

said second optoisolator is in communication with said interconnection cable,
a forward/reversing relay,
said forward/reversing relay in communication with said P-L actuator activation relay and said CH actuator activation relay,
a first voltage regulator and a second voltage regulator,
said first voltage regulator in communication with said power source and provides Vcc,
said second voltage regulator in communication with said power source and provides 9_Vdc.

26. A computerized method for remotely adjusting the P-L and CH of an antenna comprising the steps of:
initializing,
prompting for parallel port connection,
prompting for power connection,
testing for the presence of wind,
prolonging sampling,
prompting for entering the number of antennas per array,
prompting for entering the number of antennas per sector,
reading P-L value from each antenna and storing in memory,
reading CH value from each sector and storing in memory,
prompting for choice of 1 to 8 options,
testing for option 1,
setting antenna address to 1,
reading P-L value,
storing P-L value in memory array,
incrementing antenna number,
pausing for a predetermined time,
testing for antenna address equal to n+1,
displaying P-L value from memory,
returning to selection screen,
testing for option 2,
prompting for address of antenna to be adjusted,
activating selected antenna,
reading a new P-L value,
displaying the P-L value,
prompting for a desired P-L value,

determining if new P-L value is smaller than desired P-L value,

activating P-L actuator motor in a reverse direction as required,

activating P-L actuator motor in a forward direction as required,

reading new P-L value,

determining if new P-L value is less than a predetermined percentage of a degree of the desired P-L value,

read another new P-L value,

deactivating the P-L actuator motor,

pausing for predetermined time,

reading a new P-L value,

displaying the new P-L value,

returning to the main selection,

testing for option 3,

prompting for sector number to be adjusted,

prompting for desired P-L value,

selecting address of the first antenna in the selected sector,

reading a new P-L value,

determining if new P-L value is smaller than desired P-L value,

activating P-L actuator motor in a reverse direction as required,

activating P-L actuator motor in a forward direction as required,

reading a new P-L value,

testing to see if the new P-L value is less than a predetermined percentage of a degree of the desired P-L value,

reading a new P-L value,

deactivating the P-L actuator motor,

pausing for a predetermined time,

reading a new P-L value,

incrementing antenna number,

pausing for a predetermined time,

displaying the new P-L value,

returning to the main selection screen,

testing for option 4,

prompting for a desired P-L value,

setting antenna address to 1,

reading a new P-L value,

determining if the new P-L is smaller than the desired P-L value,

activating P-L actuator motor in a reverse direction as required,

activating P-L actuator motor in a forward direction as required,

reading a new P-L value,

determining if the new P-L is less than a predetermined percentage of a degree of the desired P-L value,

reading a new P-L value,

deactivating the P-L actuator motor,

pausing for a predetermined time,

reading a new P-L value,

determining if the new P-L is less than a predetermined percentage of a degree of the desired P-L value,

determining if the new P-L value is smaller than the desired P-L value,

incrementing the antenna address,

testing for antenna address equal to n+1,

reading a new P-L value,

returning to the main selection screen,

testing for option 5,

displaying exit statement,

testing for option 6,

testing for option 7,

testing for option 8,

prompting for sector selection,

setting selected sector address,

reading new CH value,

displaying CH value,

prompting for desired CH value,

determining if the difference between the new CH value and the desired CH value is smaller than a predetermined percentage of a degree,

activating CH actuator motor in a reverse direction as required,

activating CH actuator motor in a forward direction as required,

reading new CH value,

determining if new CH value is less than a predetermined percentage of a degree of the desired CH value,

reading a new CH value,

stopping the program.